ARC Technologies Inc.

Massachusetts Manufacturing Extension Partnership

Lean Makes its Mark at ARC Technologies, Inc.

Client Profile:
ARC Technologies, Inc., is a leading supplier of microwave absorbers which are made of various materials and absorb unwanted microwaves and turn them to heat. Eighty percent of their work is defense related and twenty percent is for commercial use in wireless technologies like GPS systems and cell phones. ARC also provides a complete range of standard absorber products, dielectric materials, composites, radomes, and radar absorbing structures (RAS). ARC employs 112 people at its facility in Amesbury, Massachusetts.

Situation:
Many of ARC's Department of Defense clients were 'going Lean,' and as a 2nd tier supplier they had to lower production costs. Global competition also made it necessary to reduce lead times. Due to their diverse product mix with high volume - quick turns and low volume - long production cycles, ARC had very different needs to address and had to become more nimble and efficient to keep their customer base. The company applied for a Workforce Training Fund Grant to assist with costs. Several employees had attended training events put on by the Massachusetts Manufacturing Extension Partnership (Mass MEP), a NIST MEP network affiliate, through NECC (Northern Essex Community College)and wanted Mass MEP to do their training. "Mass MEP and NECC had the correct balance of classroom and hands-on training that we were looking for to create a successful program," said Mary Joaquin, Human Resource Manager and Lean Program Coordinator.

Solution:
Mass MEP conducted 58 training sessions on Transformation, Planning and Leadership,Value Stream Mapping and Kaizen. ARC employees also participated in TimeWise LE102 which is Lean training for Job Shops, and introduces basic Lean terms and processes in classroom and simulation events. After basic Lean training, ARC began looking at the value streams in some of the key factories. From these came spaghetti diagrams of travel and current and future state maps to help with the strategy for their Kaizen events. The teams cleaned, rearranged, threw out, labeled, organized and made the areas work more efficiently.
As a job shop, ARC has a wide variety of products and batch sizes. Their internal manufacturing operations are broken down into six primary categories of production they refer to as 'factories.' The event tours focused on four areas: Core, Thermoplastics, Composites and Advanced Materials. Composites was chosen as a Kaizen site because of the volume and high level of processing required. The work ranges from single piece prototypes to 100 piece lots, an average of 120-200 pieces per month. There were inefficiencies due to large amounts of clutter, disorganization and excess travel of material and people in those processes. By consolidating materials to dedicated areas and freeing up floor space it allowed the purchase of a new more efficient oven. Production increased from 10 to 60 radomes (covers for antenna) per month to 160, a 200 percent increase in volume. Travel was reduced from a quarter mile to 100 to 200 feet. There has been a decrease in rework and scrap, with

a salvage rate of 90 percent. 5S techniques helped with organization and avoiding material contamination. Materials were reorganized and labeled, racks were utilized, and the space was reclaimed. HVAC and ergonomic changes were added for comfort. These improvements aided in reducing inspection time from two hours to five minutes.

Advanced Materials, one of ARC's oldest lines, was plagued by rework and travel waste. They produce coated aluminum tubes, or epoxy metallic filled absorbers. Rework is an issue because of air bubbles forming in the heavy metallic powders. Another machine now mixes and ejects epoxy into the tubes. This was a two-person operation but one person spent most of the time walking between rooms. The process was moved into one room and the second person was freed up to do more value added work. Value Stream Mapping helped identify waste and cut costs 25 percent. Batch sizes were reduced 25 percent. Handling was reduced 75 to 85 percent, and wait time reduced by an hour and a half. Travel distance was reduced from 2,000 feet to 200 feet.

The next area of improvement was in Core Products. This area produces coated foam sheets. The sheets are dipped into a carbon loaded spray acrylic then dried for 12 hours. Dry sheets are milled to thickness, run through a press, sanded, adhesive is applied to the back of them, and then they are cut to size. Value Stream Mapping and spaghetti diagrams showed that the layout in this area was inefficient. Two mills were in the center of the room and everyone ran back and forth between them; now there is one larger machine that makes one large sheet and has cut production time in half. Now product flows from presses and mills to shipping on rollers so there is no walking. Some popular sizes of foam are being precut and stored near where the dipping occurs for added efficiency. Changing the layout and using rollers has reduced travel time by 38 percent, reduced WIP by 70 percent and total sheet cycle time by 30 percent. Lead time was cut to less than half, from 6-8 weeks to 2-3 weeks. "At first it was very hard to convince the employees that one piece flow would actually work better," said Jason Burke, Operations Manager in Core Products. "Basic Lean training opened their eyes. You only go as fast as your slowest person or machine. When you take care of the little things it frees you up to deal with the bigger issues more effectively. We did an INTENSE Kaizen and really ripped the place apart. Everyone has seen the results and is really into making things better," he added. Eighteen months ago the area was cluttered and there was no flow. Introducing single piece flow has resulted in increased floor space, 36 percent reduced travel in the area, and cost reduction of 22 percent. It used to take three days to produce 100 pieces; now they produce 100 pieces in an hour, or one piece every 30 seconds.

In the Thermoplastics area, a customer's specifications required that they use 2 x 4 sheets to machine parts from. This resulted in accumulated remnants and scrap. ARC programmers proved to the customer that they could machine the parts from a 2 x 3 sheet which saved the client money plus generated less scrap. With this small change, ARC saw a 39 percent savings on material use per quarterly cycle. In this department they also looked at handling and moving materials and were able to reduce product travel 66 percent, saving 2.1 hours of time. With these improvements Thermoplastics will save over $100,000 a year.

Results:

* Increased sales by 16 percent.
* Invested $178,000 in capital improvements.
* Reduced surface imperfections and handling damage by 13 percent.
* Increased on time delivery from 83 percent to 95 percent.

* Freed up floor space.

Testimonial:
"We are doing Lean aggressively! Out of all the great results you will hear about and see, the biggest value to the company has been the boost in morale and sense of ownership that the employees have. They know that they have some control over the way the company operates- they believe in ARC and are committed to our success."

Chip Madden, President